

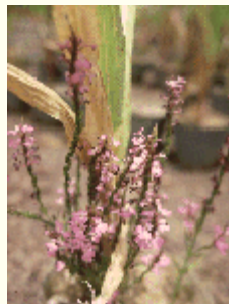


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# Fungus Fights Cereal Killer in Africa

*by Philip Fine*



**Striga is a serious constraint to cereal crops such as sorghum**

When the head of a family farm in Mali looks out over crops of maize or millet and sees a vibrant pink flower spreading throughout the family's land, the reaction is one of resignation. The farmer knows that the treacherous weed named striga has returned. It means lost hard work, diminished potential income, and less food available for the family.

The family may pull out some of the weeds, but the damage began long before the striga flowers appeared. Even rotating the crops or using new fertilizers does little to stop the weed's spread. Each striga plant yields thousands of seeds, which means that next year's crop will likely be stunted as well, by a weed that chokes the roots of other plants and leaches nutrients that would otherwise nourish cereal plants.

Striga is a serious constraint to sorghum, millet and maize production in the dryland zones of Africa, accounting for crop losses as high as 70% among subsistence farmers. Striga is also a problem in sub-humid to humid regions. It is estimated that two-thirds of the 73 million hectares devoted to cereal crops in Africa are seriously affected by striga, which thrives under conditions of low soil fertility and decreasing plant diversity. The overall revenue loss from striga in Africa is estimated at US\$7 billion per year.

## **Search for striga's enemies**

In 1991, IDRC funded a team at McGill University in Montreal to search for substances present in African soil that could control the cereal-killing weed. Although striga has no known natural enemies, the researchers identified a hundred promising fungal pathogens in the fields of Burkina Faso, Niger and Mali.

In experiments conducted in Canada, eight of the soil pathogens proved effective in stopping the striga weed. Studies showed that the most deadly foe of striga, *Fusarium oxysporum*, is not toxic to humans and causes no harm to cereal crops.

In 1995, the scene shifted from a quarantined facility at McGill to testing in a sorghum field in Mali. The results were dramatic. Eighty-five percent of the striga weed was wiped out at the seedling stage by the *Fusarium* fungus, which had been grown on sorghum waste, dried, and then spread over the fields. At harvest time, there was almost twice as much grain and 70% less striga.

### Testing *Fusarium*'s effectiveness

While such data are encouraging, [Dr Alan Watson](#) and [Marie Ciotola](#) of the McGill Biopesticide Research Laboratory caution that further studies are needed to evaluate the effectiveness of *Fusarium* under different climate and soil conditions. By 1999, the McGill team — which is collaborating with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and Mali's Institut d'Économie Rurale — expects to have more conclusive results.

One of the most encouraging properties of the *Fusarium* fungus is that it is relatively easy to multiply. In the next phase of this project, team members will seek the input of Malians and visit local villages to see whether *Fusarium* production could be handled by individual farmers or by cooperatives set up for this purpose. The dried fungus, which can be stored for months without any measured reduction in potency, will eventually stay in the hands of local farmers. If all goes well, someday they can spread the fungus on their fields, preventing them from turning pink with striga and ensuring an abundant grain harvest for their family and their neighbours.

*Philip Fine is a Montreal writer and Canadian correspondent for the Times of London Higher Education Supplement.*

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Related articles and publications:

[\*Farming systems of the African savanna: A continent in crisis\*](#) by Andrew Ker.

Ciotola, M.; Watson, A.K.; Hallett, S.G. 1995. Discovery of an isolate of *Fusarium oxysporum* with potential to control *Striga hermonthica* in West Africa. *Weed Research*, 35, 303-309.

Ciotola, M.; Hallett, S.G.; Watson, A.K. 1996. Impact of *Fusarium oxysporum* isolate (M12- 4A), a biocontrol agent for *Striga hermonthica*. In Moran, V.C.; Hoffman, J.H., ed., *Proceedings of the IX International Symposium on Biological Control of Weeds*. 19-26 January 1996, Stellenbosch, South Africa. University of Cape Town, Cape Town, South Africa. [In Press]

Diarra, C.; Ciotola, M.; Hallett, S.G.; Hess, D.E.; Watson, A.K. 1996. Mass production of *Fusarium oxysporum* (M12-4A), a biocontrol agent for *Striga hermonthica*. In Moran, V.C.; Hoffman, J.H., ed.,

Proceedings of the IX International Symposium on Biological Control of Weeds. 19-26 January 1996, Stellenbosch, South Africa. University of Cape Town, Cape Town, South Africa. [In Press]

Diarra, C. 1996. Development of *Fusarium oxysporum* as a bioherbicide for the control of *Striga hermonthica* (Del.) Benth. McGill University, Montreal, Quebec. Msc thesis.

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